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3x

directorater
reorganized

By Mark Whalen



Dutch Slager/JPL Photolab

Engineering and Science Director John Beckman has outlined plans for a reorganization of the directorate to address the Laboratory’s challenges over the coming decade.

Beckman said now is the right time to begin implementation of the reorganization and have it in place for the beginning of fiscal year 2005 in the fall. He noted that the Lab now has six missions in phase C/D but that number will peak to 15 by fiscal year 2007. “The bottom line is if we didn’t do it now, it will be really tough later on,” he said. “The timing is opportune.”

Two years in the making, the directorate’s reorganization is based on five major themes:

- Group flight system–level software with critical mission operational software.
- Combine system engineering and mission software to achieve consistent, integrated flight and ground systems.
- Combine guidance, navigation and control in one division, to more effectively enable missions of complex dynamics.
- Create a Project and Engineering Services Division, grouping most hardware, software and support services, charged with the efficient operations of multimission facilities and services.
- Utilize lateral processes more effectively in carrying out ESD work.

Within these themes, seven divisions, based on products and function, will emerge: Systems and Software, Science, Telecommunications, Robotic Systems, Mechanical Systems, Project and Engineering Services, and Instruments and Science Data Systems.

Systems and Software is a relatively new organization, an amalgam of the current Divisions 31 and 36. A new Project and Engineering Services Division will focus on strategic infrastructure needs, offering test and analysis support through best practices in service center management. “To emphasize Dr. Elachi’s commitment to this, and mine,” Beckman said, “we will ask for a report on the state of the Laboratory’s infrastructure within 90 days of the naming of the division manager.”

Beckman said 233 of the Directorate’s 237 current groups will remain together. Of the 35 current technical sections, 23 will remain intact, with six sections standing to lose one group and six other sections to lose two or more groups.

The new organization chart accounts for all 3,451 of the Lab’s technical and science population.

Beckman said an external technical division advisory board advocated integrating the division’s work to “lateral processes” that are independent of the organizational structure. Fourteen processes have been identified: system engineering, software engineering, flight hardware, surface access concept development, proposal development, high-performance computing, system test, contracted spacecraft, science, mission operations, future work planning, mission proposal product development, facilities usage and instrument implementation.

Jobs for the six engineering division managers and their deputies will be competed. The Science Division (32) was recently restructured to enhance collaboration between JPL scientists and the academic community, industry and other national laboratories. The results of that restructuring are progressing well, Beckman said; therefore, Division 32 is not included in this plan.

Beckman said changes in the new division managers’ jobs will include an increased emphasis on the leadership of the lateral processes—which means an increased emphasis on strategic leadership—and an increased proficiency in decision making, delegation, change management and product line management. “We’re expecting division managers to have a significant breadth of experience in these areas,” he said.

With the expanded leadership roles, Beckman said, “new division managers can expect that the Lab might elect to rotate and reassign them to satisfy other JPL management or business needs in the future. This supports the director’s position on executive and senior management personnel rotation at the Lab.”

A selection committee representing Divisions 4X, 6X, 7X, 8X and 9X will assist Beckman in the search. Beckman is scheduled to announce the division manager appointments June 18. New division managers will then advertise for and select their deputies. The new divisions will be structured by their managers and a technical change control board, a process that is set to be formalized by mid-July. Section managers and their deputies will then be selected, and a sub-unit design team will formalize the new group structure by late August.

Until late September, reorganization efforts will focus on the mapping of people and cost accounts to the Oracle structure, as well as reorganization Oracle processing. The reorganization is scheduled to “go live” Sept. 27.

For more details on the reorganization, log on to <http://esd> and click on “2004 Reorganization.”

Rover

circles
crater’s
rim

By Guy Webster



JPL’s Mars Exploration Rover Opportunity has begun sampling rocks blasted out from a stadium-sized impact crater the rover is circling, and the very first one may extend our understanding about the region’s wet past.

Opportunity is spending a few weeks examining the crater, informally named “Endurance,” from the rim, providing information scientists will use for a decision about whether to send the rover down inside. That decision will take into account both the scientific allure of rock layers in the crater and the operational safety of the rover. Opportunity has completed observations from the first of three planned viewpoints located about one-third of the way around the rim from each other. Mission controllers at JPL are sending the rover around the crater’s rim counterclockwise.

“As we were proceeding from our first viewpoint toward our second viewpoint, we saw a rock that looked like nothing we’d ever seen before,” said Dr. Steve Squyres of Cornell University, principal investigator for the science instruments on both rovers. The rock appears to have come from below the area’s current surface level, tossed up by the impact that excavated Endurance Crater.

This rock, dubbed “Lion Stone,” is about 10 centimeters tall and 30 centimeters long (4 inches by 12 inches). In some ways it resembles rocks that provided evidence of past water at the smaller crater, “Eagle Crater,” in which Opportunity landed. Like them, it has a sulfur-rich composition, fine layering and spherical concretions, and likely formed under wet conditions.

“However,” Squyres said, “it is different in subtle ways from what we saw at Eagle Crater: a little different in mineralogy, a little different in color. It may give us the first hint of what the environment was like before the conditions that produced the Eagle Crater rocks.”

Inside Endurance Crater are multiple layers of exposed rocks that might provide information about a much longer period of environmental history. From the viewpoints around the rim, Opportunity’s miniature ther-

mal emission spectrometer is returning data for mapping the mineral composition of the rocks exposed in the crater’s interior.

“We see the coarse hematite grains on the upper slopes and basaltic sand at the bottom,” said Dr. Phil Christensen of Arizona State University, lead scientist for that spectrometer. “Most exciting is the basalt signature in the layered cliffs.” Basalt is volcanic in origin, but the thinness of the layers visible in the cliffs suggests they were emplaced some way other than as flows of lava, he said.

“Our working hypothesis is that volcanically erupted rock was broken down into particles that were then transported and redeposited by wind or by liquid water,” Christensen said.

At a May 17 press conference in Montreal, Christensen and Squyres presented previews of rover-science reports scheduled at a joint meeting of the American Geophysical Union and the Canadian Geophysical Union.

Although the stack of rock layers at Endurance is more than 10 times thicker than the bedrock exposure at Eagle Crater, it is still only a small fraction of the 200-meter-thick (650-foot) stack seen from orbit at some other locations in Mars’ Meridiani Planum region. A close-up look at the Endurance Crater rocks could help with interpreting the other exposures seen from orbit. “It’s possible that the whole stack was deposited in water—some particles washed in by flowing water and others chemically precipitated out of the water,” Christensen said. “An alternative is that wind blew sand in.”

Halfway around Mars from Opportunity, Spirit is driving toward highlands informally named “Columbia Hills,” where scientists hope to find older rocks than the ones on the plain the rover has been crossing. The rover could reach the edge of the hills by mid-June. “Spirit is making breathtaking progress,” Squyres said. “The other day it covered 124 meters (407 feet) in one day. And that’s not a parking lot we’re crossing. It’s hilly, rock-strewn terrain. This kind of pace bodes well for having lots of rover capability left when we get to the hills.”

News Briefs



Photo courtesy of Eastwood Im

The CloudSat
Cloud Profiling Radar
Instrument Team.



The annual Firefighters Quest for Burn Survivors fundraiser is underway through June. A caravan of Quest vehicles will conduct a statewide rally visiting participating fire departments, including JPL, the morning of June 9. Last year more than \$1,600 was raised through T-shirts sales; this year's goal is \$2,000. Shirts are \$10. For information on the fundraiser, contact Carlos Ulloa or any other member of the JPL Fire Department at ext. 4-3311.

CloudSat radar tests in open air

The CloudSat project's Cloud Profiling Radar successfully completed open-air tests in early May. The instrument was moved from the Spacecraft Assembly Facility High Bay 1 test area to the airlock area. During the test, with the SAF door open half-way, the radar transmitted 94-GHz radio frequency signals via the 1.85-meter antenna out to the atmosphere at the elevation angles between 15 and 45 degrees. The radar echoes back-scattered from the atmospheric targets (cloud particles) within the radar's field-of-view were captured by the antenna and receiver. The echoes (analog) were then converted to digital signals and recorded. Subsequent processing will remove noise and deduce the cloud intensity and thickness information.

CloudSat's launch is scheduled for no earlier than January 2005. CloudSat's trio of satellites will be the first spacecraft to study clouds on a global basis. Their data will contribute to better predictions of clouds and their role in climate change.

Spitzer shares the wealth

Like a philanthropist donating a private collection to a museum, the JPL-managed Spitzer Space Telescope has opened a virtual vault rich with scientific data. The Spitzer Science Archive provides astronomers access to the infrared telescope's data well before the mission's one-year anniversary in space. For members of the science community it's as easy as going to the Spitzer home page and using a browser interface to download the data. To mark the occasion, NASA is releasing two new dazzling Spitzer images. Non-scientists can view a sample of Spitzer images at <http://www.spitzer.caltech.edu/Media/mediaimages/data.shtml>. Spitzer was launched last August. Its high-tech infrared eyes observe galaxies, infant stars and newly forming planetary systems that have escaped the view of other observatories.

Ethics training now available

The Ethics Office is now scheduling classes for various group, section or division presentations. Invite an ethics advisor to an upcoming staff meeting. Training sessions last about one hour. Once you have a location, contact MARTHA AVIÑA at ext. 4-3154 or by e-mail to schedule your ethics training.

Training will also be available Lab-wide in the larger conference rooms. Log on to <http://hr/et> to view the class schedule and enroll. Online ethics training will be available in the near future. Ethics training must be completed by Sept. 30.

Two architectures chosen for TPF

Included in the nation's new vision for space is a plan for NASA to "conduct advanced telescope searches for Earth-like planets and habitable environments around other stars." To meet this challenge, NASA has chosen to fly two separate missions with distinct and complementary architectures to achieve the goal of the JPL-managed Terrestrial Planet Finder. The purpose will be to take family portraits of stars and their orbiting planets and to study those planets to see which, if any, might be habitable, or might even have life. Both missions would launch within the next 10 to 15 years. The two missions:

- Terrestrial Planet Finder-C: a moderate-sized visible-light telescope, similar to the 4- by 6-meter (13.1- by 19.6-foot) version currently under study, to launch around 2014. Onboard coronagraph instrumentation will use a central disc and other specialized techniques to block the glare of a star, allowing detection and characterization of dimmer planets around it.
- Terrestrial Planet Finder-I: multiple spacecraft carrying 3- to 4-meter (9 to 13 foot) infrared telescopes flying in precise formation, to launch before 2020, and to be conducted jointly with the European Space Agency. Combining the infrared, or heat radiation, gathered by the multiple telescopes using a technique called interferometry, will simulate a much larger telescope. This will enable the mission to detect and study individual planets orbiting a parent star observed by TPF-C and also new ones beyond the reach of TPF-C.

Earth science conference signups

NASA's Earth Science Technology Office is presenting the fourth annual Earth Science Technology Conference in Palo Alto, Calif., June 22-24. The conference will showcase a wide array of technology research related to NASA Earth science efforts. Attendees will encounter new developments in information systems, computing, instruments and component technologies, and will learn about the vision and future needs for Earth science technology. For more information and to register, log on to <http://esto.nasa.gov/conferences/estc2004>.

New Explorer Schools selected

NASA has selected 50 new Explorer Schools from 34 states, including five from Southern California. The Explorer Schools Program is a major NASA education effort to inspire the next generation of explorers. The five Southern California schools recently selected are Lake View Elementary in Huntington Beach, Lakewood High School in Lakewood, Flory School in Moorpark, North Ridge Elementary in Moreno Valley, and Mesa Union Elementary in Somis.

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Meetings are available. Call the Employee Assistance Program at ext. 4-3680 for time and location.

Caregivers Support Group—Meets the first Thursday of the month at noon in Building 167-111 (the Wellness Place). For more information, call the Employee Assistance Program at ext. 4-3680.

Codependents Anonymous—Meeting at noon every Wednesday. Call Occupational Health Services at ext. 4-3319.

Gay, Lesbian and Bisexual Group—Meets the first Friday and third Thursday of the month at noon in Building 111-117. Call the Employee Assistance Program at ext. 4-3680 or Randy Herrera at ext. 3-0664.

Parents Group for Children With Special Needs—Meets the second Thursday of the month at noon in Building 167-111 (the Wellness Place).

Working Parents Support Group—Meets the third Thursday of the month at noon in Building 167-111. For more information, call the Employee Assistance Program at ext. 4-3680.

Friday, May 21

Von Kármán Lecture Series—Nagin Cox, deputy team chief on the Mars Exploration Rover Project's Spacecraft Rover Engineering Team, will present "Step by Step. Robotically at the Red Planet," at 7 p.m. in Pasadena City College's Vosloh Forum, 1570 E. Colorado Blvd. For more information, call Public Services at ext. 4-0112.

Wednesday, May 26

JPL Library Orientation—Come to Building 111-104 from 11:30 a.m. to noon for an overview of the Library's products and services, and learn how to access numerous electronic resources from your desktop. For more information, call the JPL Library Reference Desk, ext. 4-4200.

JPL Toastmasters Club—Meeting at 5 p.m. in conference room 167. For more information, call Debbi Llata, ext. 4-8374.

Volunteer Professionals for Medical Advancement—Meeting at 10:30 a.m. at the Caltech Credit Union, 528 Foothill Blvd., La Cañada.

Thursday, May 27

Caltech Architectural Tour—The Caltech Women's Club offers this free tour, which is open to the public. Meet at the Athenaeum front hall, 551 S. Hill Ave., Pasadena. Tour begins at 11 a.m. and lasts 1 1/2 hours. For reservations, call Susan Lee at (626) 395-6327.

JPL Golf Club—Meeting at noon in Building 306-302.

Fri., May 28; Sun., May 30

Piano Recitals—Caltech Pianist-in-Residence James Boyk will perform free concerts at 8 p.m. Friday and 2:30 p.m. Sunday, each in Ramo Auditorium. For more information, call (626) 395-4652.

Tuesday, June 1

JPL Gamers Club—Meeting at noon in Building 301-227.

JPL Genealogy Club—Meeting at noon in Building 301-271.

Wednesday, June 2

JPL Library Orientation—Come to Building 111-104 from 11:30 a.m. to noon for an overview of the Library's products and services, and learn how to access numerous electronic resources from your desktop. For more information, call the JPL Library Reference Desk, ext. 4-4200.

Thursday, June 3

Clogging Class—Meeting at noon in Building 300-217. For more information, call Shary DeVore at ext. 4-1024.

JPL Gun Club—Meeting at noon in Building 183-328.

Sunday, June 6

Chamber Music—Calico Winds will perform a free outdoor concert at 2:30 p.m. at Old Mill, 1120 Old Mill Rd., San Marino. This is part of Caltech's chamber concert series and is performed off campus during Dabney Lounge's remodeling. For more information, call (626) 395-4652.

Tuesday, June 8

JPL Stamp Club—Meeting at noon in Building 183-328.

Wednesday, June 9

JPL Amateur Radio Club—Meeting at noon in Building 238-543.

JPL Toastmasters Club—Meeting at 5 p.m. in conference room 167. For more information, call Debbi Llata, ext. 4-8374.

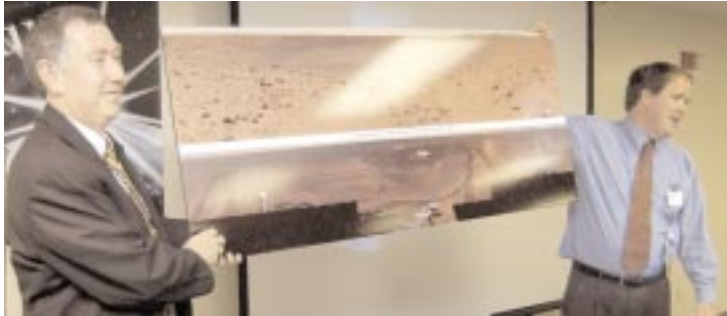
Thu.-Fri., June 10-11

Von Kármán Lecture Series—Dr. Charles Beichman, executive director of Caltech's Michelson Science Center, will present "Finding Planets and Searching for Life: Worthy Goals for 21st Century Science," at 7 p.m. Thursday in von Kármán Auditorium and Friday in Pasadena City College's Vosloh Forum, 1570 E. Colorado Blvd. Thursday's lecture will be webcast at <http://www.jpl.nasa.gov/events/lectures/jun04.cfm>. For more information, call Public Services at ext. 4-0112.

Lab contractor wins Low award

MER Project Manager
Richard Cook, right,
presents a congratulatory
gift from JPL to
Spectrolab President
Dr. David Lillington.

JPL contractor Spectrolab recently received NASA's George M. Low Award, the agency's highest honor for quality and technical performance. It is the nation's oldest award for organizational quality. NASA Administrator Sean O'Keefe presented the awards to three U.S. companies at the NASA Continual Improvement and Reinvention Conference. Spectrolab, a Boeing Company based in Sylmar, received the award in the Large Business Product category. Spectrolab was nominated by JPL for a body of work supporting NASA's mission, including the Mars Exploration Rovers (for which Spectrolab provided solar panel arrays) and Mars Reconnaissance Orbiter missions. "This is a great honor for Spectrolab and our associates, whose dedication and energy have contributed to the success of various NASA programs such as the Mars Exploration Rovers," said Spectrolab president Dr. David Lillington. "We are proud to be part of NASA's programs that continue to push back the frontiers of space."



Bob Brown/JPL Photolab

Spectrolab has provided on-time delivery of high-efficiency space solar cells and panels to meet critical mission requirements on numerous NASA programs, including Mars Global Surveyor, Near Earth Asteroid Rendezvous, High Energy Solar Spectroscopic Imager, Far Ultraviolet Spectroscopic Explorer and the Submillimeter Wave Astronomy Satellite. Companies were evaluated for performance, cost, schedule, innovation, management leadership, customer orientation, adherence to the Total Quality Management philosophy and alignment of organizational goals with NASA's strategic plans. In attendance from JPL were Deputy Director Eugene Tattini, MER Project Manager Richard Cook, MER Chief Scientist Joy Crisp, Acquisition Section Manager Andre Stefanovich, MER contract technical manager Paul Stella and Office 108 Low Award coordinator Martin Johnson. Besides the category for which Spectrolab was honored, Low Award categories also include Large Business-Service, Small Business-Product and Small Business-Service. Johnson noted that nominations for next year's awards are now open. Qualifications include significant performance in customer satisfaction and contract technical performance, schedule, cost, management initiatives responsive to NASA's strategic goals, leadership and continuous improvement, research and development and/or innovative technology breakthroughs, and items of special interest to NASA. If you know of a subcontractor whose performance you believe deserves consideration for a GML nomination, contact Johnson at ext. 3-6060 or via e-mail, or contact the acquisition subcontract manager working with the subcontractor up for consideration.

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EARN LEVEL A BONUS AWARD



HONOR IS

HIGHEST LEVEL

IN JPL’S AWARD

PROGRAM

Twenty-five of JPL’s top performers were formally honored at a Level A Bonus Award ceremony held May 5. The first-of-its-kind event was held at the Brookside Country Club in Pasadena.

JPL Director Dr. Charles Elachi, Deputy Director Gene Tattini, former Director Dr. Ed Stone and several of JPL’s senior managers, including the Executive Council, joined honorees and their guests. “Tonight, the senior management team at JPL has set aside this time to formally recognize the honorees by showing our appreciation for excellence in performance and congratulating you on a job well done,” Tattini told the gathering.

The JPL Bonus Award Program was established in 1999. Today it consists of five different monetary awards for individuals and teams. The Level A Bonus Award is based on four categories of excellence and is the highest award level in JPL’s program. Award categories are Scientific and Technical Excellence, Effective Business Management, Effective Partnerships and Relationships and Strategic Leadership. “These categories are critical elements and part of the JPL Implementation Plan,” Elachi said. “Excellence in these areas will ensure JPL’s success today and help us plan for an exciting future.”

Four individuals were also honored with the Dr. Edward Stone Award for Outstanding Research Publication, presented jointly by Stone and Chief Scientist Dr. Tom Prince.

Elachi closed the ceremony by thanking the honorees. “Your contributions and achievements have enabled JPL to enjoy much success over the last couple of years. You are the Laboratory’s greatest asset and we are proud to have you on our team.”

The 2004 Level A Bonus Award Honorees:
Scientific and Technical Excellence

Mark Adler: Technical leadership of the Mars Exploration Rover landing site selection team.

Magdy Bareh: Technical contributions to the Spitzer Space Telescope flight and ground system capabilities, and team building with JPL partners at Lockheed and Ball.

Yoaz Bar-Sever: Technical contributions to the NASA real-time global differential GPS system for low-Earth and terrestrial navigation and monitoring.

Joy Crisp: Technical leadership as the project scientist for the generation of landing site environmental information for the Mars Exploration Rover mission, leading to a successful landing on Mars.

James Donaldson: Technical contributions and leadership as the lead systems engineer of the Mars Exploration Rover mission avionics subsystem and for efforts resolving the Spirit Rover malfunctions.

Joel Krajewski: Technical contributions to the Mars Exploration Rover mission through the technical planning, design and development of the impact-to-egress mission phase.

Wayne Lee: Technical contributions as lead systems engineer for the performance assessment and simulation modeling of entry, descent and landing for the Mars Exploration Rover mission.

Susan Linick: Technical leadership in planning and managing the in-orbit checkout of the Spitzer Space Telescope.

Robert Manning: Technical contributions and leadership as the lead flight systems engineer for the Mars Exploration Rover mission.

Tracy Neilson: Technical contributions to the Mars Exploration Rover avionics systems and flight software and resolving the Spirit Rover malfunction.

Glenn Reeves: Technical contributions and leadership in the design, development and implementation of mission-critical Mars Exploration Rover flight software.

Eric Rignot: Technical contributions to the scientific understanding of the evolution and physics of glaciers in Greenland and Antarctica.

Alejandro San Martin: Technical contributions and leadership in the development of the Mars Exploration Rover guidance and control systems.

Jason Willis: Technical contributions and leadership as the lead systems engineer for the Mars Exploration Spirit Rover entry, descent and landing subsystems.

Effective Business Management

Amanda Beckman-Hezel: Leadership in developing and implementing significant acquisition process improvements for major institutional procurements.

Penny Carter-Lockert: Leadership of the JPL team that effectively communicated and implemented major healthcare plan revisions.

Effective Partnerships and Relationships

Harrel Crenshaw: Contributions to implementing and operating a comprehensive Procurement Quality Assurance system at JPL.

Strategic Leadership

David Crisp: Leadership in the selection of the Orbiting Carbon Observatory, the first Earth System Science Pathfinder mission with a NASA center principal investigator.

Gregory Hickey: Leadership in the development and demonstration of new lightweight nanolaminate mirror technology for future astronomy and physics missions.

Edward Hirst: Leadership of the Stardust mission design team contributing to the successful flyby of comet Wild 2.

Michael Werner: Scientific and technical leadership as the Spitzer Space Telescope project scientist and science working group chair.

Edward Stone Award For Outstanding Research Publication

Steven Chesley: Scientific research and publication on the effects of thermal re-radiation (Yarkosvky effect) on the orbital motion of asteroids.

Peter Day: Scientific research and publication demonstrating super conducting kinetic inductance detectors suitable for multiplexing into large-format imaging arrays.

Ian Joughin: Scientific research and publication of ice stream dynamics based on satellite and in-situ observations of the West Antarctica Siple Coast Ice Streams.

Christopher Webster: Scientific research and publication on water isotope mapping to improve our understanding of atmospheric water vapor.

JPL’s May 15-16 Open House was once again a smash hit with the public, drawing an estimated crowd of 20,000 each day. Here is a sample of the activities as captured by the Photolab’s Bob Brown. Clockwise, from above right: Guests at the Mars exhibit chat with JPL Director Dr. Charles Elachi and Dr. James Cutts, chief technologist of the Solar System Exploration Programs Directorate; an astronaut suit at NASA’s exhibit; visitors queue for a peek through a solar telescope; and a Mars Exploration Rover full scale model standing sentinel.

Lab shows off its best at OPEN HOUSE



Building 97 gets 86'd



Bob Brown/JPL Photolab

Passings

PADDY JOHNSTON, 77, a retired Deep Space Network operations engineer, died March 29.

Johnston came to JPL in 1967 from the DSN facility in Canberra, Australia. He joined Section 337 as an assistant project engineer for Mariner Mars 69 and later served as the DSN project engineer for the Viking Project. He also worked as DSN frequency coordinator in the Telecommunications and Mission Operations Directorate, Section 440, and later moved to NASA Headquarters as a detailee on frequency allocation and management.

Johnston leaves his wife, Marguerite, three daughters and seven grandchildren. In lieu of flowers, contributions may be made in his memory to the Alvin A. Dubin Alzheimer's Resource Center, 10051 McGregor Blvd., Suite 101, Ft. Myers, FL 33919.

Letters

I would like to thank all of my JPL friends and colleagues for their kind words, the sympathy cards, and the beautiful plant that I received following the death of my mother. These expressions of condolence are greatly appreciated.

Louis D'Amario

A very sincere thanks to my Voyager family for their outpouring of sympathy on the passing of my mother-in-law. Also, I would like to thank to the JPL ERC for the beautiful plant.

Jefferson Hall

To my many friends and co-workers, I would like to extend a sincere "thank you" for making my many years at JPL an outstanding and memorable experience. I also want to thank those who attended my retirement celebration at von Kármán, where I was presented with some very touching words of congratulations, recognition and terrific award plaques. JPL has been my home for 43 years and having the opportunity and pleasure to have worked 20 space-craft launch projects with many outstanding team members is something that will remain in my thoughts forever. What a heart full of memories you friends and co-workers have given me. You all will be greatly missed and I look forward to the day when our paths will cross again. Thanks for the memories.

Tom Shain

Classifieds

For Sale

AIR CONDITIONERS: Kenmore, 8000 BTU, exc. cond., \$200; Amana, 6550 BTU, gd. cond., \$50; CEILING FAN, Casa Vieja, white/gold, 5-blade, 3 spd., 4 lights, vg cond, \$75. 626/633-0073. BEDS, trundle, twin sizes, mattress, black metal frame, upper matr. gd. cond., lower matr. like new, orig. pd. \$750, sell for \$100, will bring to JPL when sold. 909/596-9202, eves. BOOK + BINDER, guitar accompaniment for English hymns, Oregon Catholic Press, Vol I-II, 2003, barely used, \$40. 626/840-0955, Mary. CLOTHES: lady's jacket, leather, black, medium size, \$50; men's slacks, size 42 x 44, \$8; men's sport coats, XL, \$10; dress shirts, new, 17-33 x 34L, \$5 ea; ties, \$1. 790-6060. CLOTHES, infant: jacket, navy blue, zip-up w/hood, by Rotschild, size 3T, exc. cond., \$7/obo; jacket, red/navy blue, zip-up w/hood, Old Navy, size 2T, exc. cond., \$5/obo; sweater, sky blue w/navy trim, button, size 3T. \$1/obo; photos available. 626/791-6101. COCKATIELS, 2 males, each has own cage w/ accessories, \$75/ea. w/cage, \$125/both w/all accessories; to a good home. 310/753-9123. COMPUTER DESK, on wheels, cherry veneer, made by O'Sullivan, model 61925, exc. cond., like new; best offer. 626/449-0997. COMPUTER MONITOR, Dell, 21" CRT, 2.5 yrs. old, low usage at home, exc. cond., costs \$630 new from Dell today, sell for \$300/obo. 626/794-7498. COUCH (6 1/2 ft.) & loveseat (5 ft.), floral pat-

tern upholstery, exc. cond., \$150/obo; COFFEE TABLE, wrought iron, great in any living room, den or rec. room, \$50. 626/446-4338.

DODGER TICKETS, selected games from season ticket pkg., loge level (orange), aisle 132, inside 1st base, 2 tickets/gm., face value (no tickets avail. for Yankees series), \$30 ea., see www.delunac.net/tickets. 626/296-1253.

DRYER, Roper, electric, extra lg., 4 cycles, 3 temps., 5 years old, gd. cond., \$50. 957-2805. EXERCISE MACHINE, Nordic Trak Pro Ski, gd. shape, Monrovia area, \$65/obo. 626/358-3730.

FURNITURE: desk, carved oak 50" W x 24" D, 2 matching bookcases, 50" H x 25" W x 12" D, \$500; Techline, office, white, 6 pcs., \$350; rug, Spanish, hand-made, 7' x 9', bright pink & orange, \$200; mirror, framed, tall, wood, \$25; server, mission, oak, 38 W x 20 D x 37 H, \$300; 2 lamps, ceramic, dusty rose, \$30. 626/584-0860, day; 626/794-3144, eve., Donna.

FURNITURE: sofa, floral; dresser set w/glass top, 2 end tables & large mirror; chest, black, Chinese style, desk & chair, brown. 790-3543.

FURNITURE: 2-piece Bassett sectional (1 pc. is a sleeper), floral print; one 40" coffee table and two 26" end tables (mission style); photos available; all in good condition; \$500/obo; parts could be sold separately. 626/791-6101. GOLF SET, complete, left handed, 9 irons (3-SW), 3 woods (1, 3 & 5), bag, balls, glove, covers, towel, jacket, tees, everything, buy today, play tomorrow, \$200. 805/403-9864, Ed. GUITAR, electric, Parker Nitely M, USA-made, solid mahogany body, two humbuckers, piezo bridge, only a few mo. old, gig bag, stereo cable, \$850/obo. reverb202@yahoo.com.

HOUSEHOLD: sofa, 90," fine cond., \$150; chairs, 6 arrow-back mid-19th Cent. rush-bot-tom, \$300; collectibles: Stengelware from Trenton, NJ, pitcher, 12 goblets, large platter, \$50; antiques: Old Wedgewood plates, reasonable prices; beer light, Olympia neon, \$40; potted cacti plants. 248-9000, Bob.

JUICE FOUNTAIN, Breville, stainless steel, great for daily use, bought 10/03, used 2-3 times only, orig. pkg., \$100/obo. 626/840-0955.

LENS, Canon EF, 28-200M USM 200M, for Canon EOS cameras, exc. cond., \$250. 661/297-5234.

MIRROR DOORS, 2, double sliding, w/rails, as new, 80" H x 30" W, \$25/pair. 626/309-0205.

MISC: pool table, 8', \$500; tablecloths, 2, slate blue, oval & 18 matching napkins/rings, \$10; shovels, \$2 ea; hoe, \$5; punch bowl set, 18 pc., \$10; mailbox, oversized, \$20; sytch, \$10; wig, red, shoulder length, \$20; cedar chest, antique (lid needs repair), \$45; food-saver w/bags, \$20; oil painting, lg., landscape, gold tones, paid \$175, sell \$75. 626/357-8210.

MOVING SALE, vg cond.: couch, 8' white; bedroom sets; dressers, beautiful; chairs, antique, classic; sofa/hide-a-bed; china hutch and credenza; file cabinets; bookshelves; dining room set; end tables; books; VHS tapes. 909/981-7492, Darlene or dhauge@yahoo.com.

PHOTOGRAPHIC DARKROOM EQUIPMENT, Beseler 67CS enlarger, 50 mm/f2.8 Nikon EL-Nikkor lens, Beseler filters, Gralab 300 enlarging timer, Omega CS-10 timer, Bogen enlarging easel, editing tools, negative developing tank, 6 lg. darkroom trays, thermometer, graduated cylinder, more, vg. cond., orig. owner, \$175 for enlarger, lens, filters, timer; \$50 for everything else. 790-5902, Carol.

SCOOTER, for disabled, Pacesaver, 4 wheel with basket, etc., new batteries, exc. cond., looks new, \$750/obo. 790-6060.

THEATER TICKETS, 2, Little Shop of Horrors, Ahmanson Theatre, Aug. 26, 8 p.m., seats in mezzanine, \$140. 790-8523.

TRAYS, "Han-D" lithographed, metal (~20), w/ 5 unopened pkgs. of paper plates, coated, divided "plates" are ~ 9" x 14", for patio, picnics, etc. 909/593-4046, vividavies@earthlink.net.

VIDEO EDITING SYSTEM, Panasonic WJ-MX12 digital audio-video mixer, 2 Sony PVM 1341 13" in/out monitors, unused; cost \$2,750, sell for \$500. 248-9000, Bob.

WASHER & DRYER, gas, Whirlpool, gd. cond., \$100 for both. 352-4102.

Vehicles / Accessories

'98 ACURA Integra, 2-dr., gd cond., 5 spd., black, 72K mi., 100K mi. warranty, am/fm/CD, \$9,700/obo. 626/705-1312 or sorozco@cefcu.org.

'96 BMW 328IS, great cond., butter smooth power, wonderful handling: a joy to drive, sports package, sunroof, 6-CD changer, premium sound, loaded, \$9,500/obo. 790-2799.

'91 BMW 525i, 4-dr., gd. cond., automatic, burgundy, 172Kmi., pwr moonroof, alarm, keyless entry, am/fm/cass., 6-CD changer, \$6,300/obo. 626/705-1312 or sorozco@cefcu.org.

CARGO CARRIER, roof mount, aluminum construction, interface includes all mounting hardware, \$50/obo. 626/358-3730.

'97 CHEVROLET Suburban LS, V8, driver & passenger airbags, power everything, no accidents, flawless condition, e-mail for pics: vake3377@yahoo.com. 846-0053.

'95 CHEVY Tahoe LT, 4 x 4, 5.7 V8, silver, exc. cond., 1 owner, 100K, auto., a/c, pwr windows/doors/locks, CD/cass., running boards, leather, roof rack, grille guard, towing pkg., sheepskin seat covers, LoJack, loaded, \$8,000. 368-6874.

'93 CHEVROLET Suburban 2500, 2 x 4, 350 V8, exc. cond. inside/out, well maint., low mileage, a/c, power doors/windows, wood trim dash, custom front seat sheepskin covers, running boards, new tires w/Weld wheel, Flowmaster exhaust and Street Scene grill insert, \$8,900. 626/359-7666.

To mark the beginning of the Lab's infrastructure renewal, JPL Deputy Director Eugene Tattini (left) and Associate Director/Chief Financial Officer Fred McNutt last month helped begin the demolition of Building 97, which had been unoccupied for about two years. The building and its surrounding area north of Explorer Road have been designated for additional parking in JPL's Facilities Master Plan. Construction of the Flight Projects Center, the first of three large buildings identified in the Master Plan, has been twice delayed, but is now scheduled to begin in FY '06.

CHEVROLET, Tonneau bed cover, for pickup, hard fiberglass, made by snug-top, white gelcoat, fits '88-'98 shortbed, incl. all mounting hardware & shocks, exc. shape, \$250/obo. 626/358-3730.

'99 FORD Taurus LX sedan, white, very clean; like new interior, cass., player, pwr windows/doors/mirrors, well maint., exc. cond., \$4,550. 310/836-0779.

'96 FORD F250 Crew Cab XLT, auto, V8, 7.5L, 60K mi., orig. owner, short bed, camper shell, tow pkg. (never used for towing), lumbar support seats, well-maint., garaged, white w/blue interior, exc. cond., must sell, \$9,800. 626/585-8213.

'88 FORD Taurus LX wagon, top of line, loaded, power seats/mirrors, keyless entry, etc., exc. cond., orig. beige finish, carefully maintained, 8 pass. capacity w/rear seat, \$2,900/obo. 626/798-2925.

'01 HONDA 929RR, exc. cond., 4K mi., \$6,500. 661/993-9091, Matt.

'01 HONDA Accord EX, 23.9K mi., 6 CD in dash w/cass., sunroof, fog lamps, cloth int., 5-speed manual, ext. warranty, LoJack, silver, car bra, a/c, great on gas, \$18,500. 949-4429.

'93 HONDA Nighthawk 750 motorcycle, black, gd. cond., 23K mi., \$1,500. 241-0444.

'94 ISUZU Trooper LS, 4D, automatic, 4WD, V6, 3.2L, DOHC, locking hubs, antilock brakes, cruise control, alarm, am/fm stereo, 12-CD player, white, exc. shape, tinted windows, new a/c, new transm's'n, pwr. steering/ windows/locks, tilt wheel, rear window defroster, rear window wiper, exterior spare tire carrier, immaculate, \$5,200/obo. 406-5104.

'00 JEEP Cherokee Grand Laredo, 46K mi., exc. cond., power door, air, CD, gray color, \$11,250/obo. 731-0470.

'96 LEXUS SC300, V6, loaded, 48K mi., power leather seats, moonroof, alloy wheels, 12-CD changer, premium sound, spoiler, gold color, exc. cond., \$12,750. 909/599-3230.

'95 MAZDA Millenia, 77K mi., 1 owner, well maint., all service records, auto, a/c, leather, 6-CD player, moonroof, cruise and climate control, power seats, new tires, \$4,800/obo. 790-4703.

'89 MERCEDES BENZ 260E, 4-door, gold, 147K original miles; garage-kept, interior perfect, looks and runs great, new tires, brakes; \$4,500. 626/794-6860.

'94 MERCURY Sable wagon, V6, 3.8L, auto, 80K mi., power steering/brakes, cruise control, dual front airbags, am/fm/cass., a/c, garaged, well-maintained, vg cond., \$2,995. 626/585-8213.

'99 REXHALL AERBUS motorhome, Ford V10, 35", only 7K mi., slideout, Levelors, 6.6 Kw gen., Corian counters, hardwd. floor, backup camera, side-by-side fridg., microwave/convection oven, 2 TVs, VCR, CD, auto. roof vents, gelcoat exterior, much more, immac.e in/out, finest quality, view at http://www. rvsearch.com/findrv/index.cfm?a=d&t=c=36261&vid=81429, below Bluebook, \$65,000. 909/944-1064.

'96 TOYOTA 4-Runner, exc. cond., new set of tires, \$7,000/obo. 626/484-1723.

'92 TOYOTA Dolphin motorhome, pastel blue, slps. 5, 16 mpg, 82K mi., V6, automatic, cruise control, awning, roof & cab air, rear ba., microwave, TV ant., innerspring mattress (not foam), linoleum floor, well-maint., manuals incl., like new inside, see photos: http://tinyurl.com/36wtv, \$13,500. 626/798-4510, Iv. msg. '02 VOLKSWAGEN Passat GLS, 1.8 turbo, 31K mi., loaded, premium sound system, moonroof, leather seats, alloy wheels, exc. cond., \$15,500. 909/599-3230.

'99 VW Golf GL (new body style), 2 dr., 5-spd., manual, red ext., dark cloth int., 58,300 mi., perfect cond. in & out, new tires, new roof rack, see http://spider.ipac.caltech.edu/staff/rafael/golf. \$8,550. 323/644-5607.

'03 YAMAHA Vstar 1100 "Silverado," less than 1,000 miles, estate sale, \$8,500. 352-1991.

Free

BBQ, natural gas, Charmglow cart model, used regularly, needs cleaning, dual burner but only one side working. 626/798-5855.

Wanted

BICYCLES & PARTS, Schwinn, preferably older models, 1960s-'80s. 626/358-3730, Randy.

CARPOOLERS from Diamond Bar, non-smoker, leaving (about) 7 a.m. 4-9329, Shu. FITNESS STEP + RISERS for aerobics, Reebok, approx. 4 x 16 x 43." 626/345-0681.

HOUSE TO RENT, mature couple seeking unfurn., for about 1 yr. perhaps longer, have 2 cats + 1 dog, if you called from last ad, please call back, I lost your number. 235-4015.

MATH TUTOR, Jr. & Sr., high school level classes, pre-algebra, geometry, algebra I & II, SAT, etc. 888/784-1639, David, eves and/or weekends, leave msg.

MUSICIANS, guitarist seeks for informal jams, rock/blues, etc. reverb202@yahoo.com.

SPACE INFORMATION/memorabilia from U.S. & other countries, past & present, for personal use. 790-8523, Marc Rayman.

TUTOR, biology & math for high school student, Pasadena area. 626/241-5954, Dana Lin.

VANPOOL RIDERS, from Victor Valley to JPL, Ext. 4-1424, Scott.

For Rent

ALHAMBRA townhouse, 2 + 2 1/2, 1,350 sq. ft., new stove/carpet/paint/dishwasher, refrigerator, laundry hookup, fireplace, patio, pool,

park views, nice area, close to shopping, movies, freeways, 20 min. to JPL, adjacent to South Pasadena + San Marino, 110 N. Chapel Ave. 213/925-2662, Nhien or Marcello Barros. ALTADENA home for lease, charming French Normandy architecture in private cul-de-sac w/quaint wishing well, walk to Altadena Golf Course, 2 bd., 1.5 ba., living room w/fireplace, washer/dryer, dining room, impeccable hardwood floors throughout, refrig. & stove, cent. a/c & heat, enclosed garden, \$2,000, incl. water & gardener. 626/399-1710, Ray Lemus.

ALTADENA house, 1 mile from JPL, 2 bd., beautiful hardwood floors, wood-burning fireplace, French doors, remodeled kitchen & bathroom, dishwasher, a/c, washer/dryer, gardener included, detached 2-car garage, gated back yard w/patio, \$1,500. 626/791-7081.

ALTADENA "sabbatical house," 3 bd. + study, boundary Angeles Nat'l Forest, 3 mi. from JPL (trails to Lab behind house), view, hardwood floors, fireplace, antiques, completely furn.: furniture, dinnerware, pots/pans, linens, down comforters, fine soaps, necessities incl.: just bring toothbrush & clothes, TV/DVD/VHS, Bose radio/CD, Dish satellite, wireless DSL, available, garden, courtyard, BBQ, parking, private, immac., month-month. 626/798-3235.

LA CANADA, private room in home, private bath, off-street parking, BBQ, pool, full kitchen priv., wash/dry, etc., available 6/15, \$550 + utilities. 790-1280.

MONTEREY HILLS condo, 2 bd., 1 ba., 3rd flr./private end unit, open and airy with nice view, fireplace, hrdwood flrs. & carpet, central air/heat, dishwasher, stove, laundry rm. (w/washer/dryer hookups), pool, secure ground-level parking, close to 110 fwy., 15 min. from JPL, \$1,200, cable, trash, gas and water included. 626/296-9073.

PASADENA condo, spacious 1 bd., 1 ba., walking distance to Caltech, close to 210 fwy., near Gold's Gym, \$1,000. 790-0308.

PASADENA condo, spacious 2 bd., 2 ba., 2-car gar., in-unit washer/dryer, fireplace, storage, 1/4 mile to Caltech, http://rental.k-von.com, \$2,295. 626/233-9496, Kevin.

PASADENA studio condo, fully furnished, 1115 E., Cordova Ave., gated facility, 2-blocks from Caltech, pool & BBQ, patio, carport, laundry, utilities paid except electric, non-smoker, no pets, \$925. 626/792-9053, Ray or Marilyn.

PASADENA, unfurn. 2 bd., 1.5 ba., 2-story townhome-style apt., central a/c, refrig & stove, laundry room, patio, parking; close to Caltech & JPL; \$1,095 + utilities. 626/429-3677 or bettyrs@earthlink.net.

Real Estate

GLENDALE, ranch-style house, upper Ross-moyne, newly remodeled, 4 bd., 2.5 ba., brand new family rm. & 2-car gar.; kitchen has new granite counter tops, GE Monogram stainless steel appliances; spacious master suite, formal dining rm., 2 fireplaces (1 in liv. rm., 1 in bdrm.), new deck overlooks park-like 13,490 sq. ft. lot, near end of cul-de-sac, 1444 Cordova, \$1.05M. 249-4536, Steve or Shelley. NATIONAL FOREST, 68 acre, 2 lg. bd., 1 ba., lg. den w/fireplace, kitchen, 2 refrig., pantry, washer/dryer, tools, electric, propane 288 gal., barn, workshop, tractor w/attach., \$289,900. 790-5586, Chris Thomas, Realtor.

Vacation Rentals

BALBOA ISLAND, cute 2 bd., 1 ba., apt., avail. weekly July-September, fully furnished, sleeps 5, covered deck, laundry, steps to bay and canal, \$1,200-\$1,500/wk. 626/429-3677 or bettyrs@earthlink.net.

BIG BEAR LAKEFRONT luxury townhome, 2 decks, tennis, pool/spa, beautiful master bd. suite, slps. 6. 949/786-6548.

CABO SAN LUCAS, very nice condo on beach, Sea of Cortez, 3 mi. north of town, peaceful & quiet, 2 bd., 2 ba., slps. 6, pools/Jacuzzis, BBQs, tennis, next to Calinda Hotel at Plaza Calafia, avail. June 26 - July 3, \$1,000. 626/791-2321 or edobinson@earthlink.net.

CAMBRIA house, ocean front, exceptional whitewater view, accom. up to 4 people, all amenities provided. 702/256-1359.

HAWAII, Maui condo, NW coast, ocean front view, 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, microwave, d/w, pool, priv. lanai, slps. 4, laundry fac., low season rate \$115/nite/2, high season rate \$130/ nite/2, \$15/nite/add'l person. 949/348-8047 or jackandrandy@cox.net.

HAWAII, 2 bd. condo in luxury 5-star Kona resort, full kitchen, pool, beach front, snorkeling, scuba, golf nearby; available June 5-12, \$950/obo. 248-0871, Cathie.

MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, slps. 6-8, fully equip'd kitchen incl. microwave, D/V, cable TV, VCR, phone, balcony w/mtn. vw., Jacz., sauna, streams, fishponds, close to Mammoth Creek, JPL disc'n't. 626/798-9222 or 626/794-0455 or valeriee@caltech.edu.

OCEANSIDE condo, on the sand, charming, 1 bd., panoramic view, walk to pier or harbor, pool/spa, game room, slps. 4. 949/786-6548.

ROSARITO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on priv. rd., 18-hole golf course 6 mi. away, priv. secure parking. 626/794-3906.

SAN FRANCISCO, Nob Hill Inn, walking dist. to Union Square, cable cars, Grace cathedral, financial district and Chinatown, non-smoking property, 15 mi. from SFO, unit sleeps 4, one week from 7/30 to 8/6/2004 (Linux World Conference week), \$600. tcfcs@aprefix.com.

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Universe is published every other Friday by the Office of Communications and Education of the Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, CA 91109.

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